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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR   | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|------------------------|---------------------|------------------|
| 10/090,208   | 03/04/2002  | David Frederick Jordan | 17805               | 3487             |
| 7590   | 08/31/2004  |                        | EXAMINER            |                  |
| Tyco Technology Resources<br>Suite 450<br>4550 New Linden Hill Road<br>Wilmington, DE 19808-2952 |             |                        | VANNUCCI, JAMES     |                  |
|  |             |                        | ART UNIT            | PAPER NUMBER     |
|  |             |                        | 2828                |                  |

DATE MAILED: 08/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                          |                     |  |
|------------------------------|--------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b>   | <b>Applicant(s)</b> |  |
|                              | 10/090,208               | JORDAN ET AL.       |  |
|                              | Examiner<br>Jim Vannucci | Art Unit<br>2828    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 26 July 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-25 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 04 March 2002 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                     | Paper No(s)/Mail Date. _____ .  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabet et al.(6,664,932) in view of Eason(6,642,898).

Claim 1, figures 1 and 4 of Sabet disclose first and second slot antennas(32 & 34) operating in the PCS and the AMPS frequency band(col. 2, line 55), and transmission lines(38 & 40) to feed the first and second slot antennas. Sabet does not disclose a separate reflector.

Figure 10 of Eason discloses a reflector(44) coupled to slot antennas to prevent energy from radiating to the back side of the antenna.

Claim 2, the radiating element disclosed in figure 1 of Sabet is made from a printed circuit board material(14).

Claim 3, Eason discloses the use of FR4 with a slot antenna(col. 6, lines 52-54) for a smaller antenna(col. 1, lines 10-14).

Claim 4, figure 19 of Sabet discloses an additional GPS patch antenna(298).

Claim 5, the reflector(44) disclosed in Eason is generally rectangular in shape.

Claims 6-8, Eason discloses a distance of .5 inches(col. 6, lines 54-55) which is approximately the recited distance and very close to the same electrical distance, one thirteenth of a wavelength for the higher disclosed frequency of 1575 MHz disclosed in Eason(col. 6, line 62). Since the electrical distances are the same for both the disclosed device and the recited device in the AMPS band, the recited distance is obvious over the disclosed distance since there is no unexpected result between the disclosed and recited devices. If the AMPS band gives a distance of one thirteenth of a wavelength, the PCS band will give a distance of one sixth of a wavelength.

Claim 9, the amount of a signal from the radiating element that is reflected by the reflector disclosed in Eason is 90% or greater of the total radiated signal striking the reflector based on it being a typical ground plane.

Claim 10, the transmission lines disclosed in figures 1 and 4 of Sabet are printed directly on the printed circuit board material(14).

Claim 11, the first and second slot antennas(32 & 34) disclosed in figures 1 and 4 of Sabet are parasitically coupled due to their close relative positioning.

Claim 12, the slot antennas disclosed in Sabet have a width less than 2.25 inches.

Claims 13-14, the transmission lines for the antennas disclosed in figure 19 of Sabet have plug terminals(290, 292, 304 & 308) for connection to communication systems.

Claims 15 and 17, the length of an antenna in one of the frequency bands disclosed in Sabet is less than 6.75 inches.

Claim 16, the transmission lines disclosed in Sabet can be adapted for connection to the communication systems using a pigtail given their position on the pcb.

Claims 18-20, the first slot antenna operating in the PCS frequency band, the second slot antenna operating in the AMPS frequency band, and the GPS patch antenna disclosed in Sabet all achieve a gain of -3 dB or greater based on their positioning with respect to the other disclosed elements of the device.

Claims 21-22, depending on their orientation, the antennas disclosed in Sabet can use vertical polarization as a primary mode of reception and can contain a horizontal polarization component.

Claims 23-25, Sabet discloses that the antenna can be mounted to windshield in a vehicle that has a roof portion and that the amount of a signal radiated by the radiating element that enters the passenger compartment is less than 10% of the total radiated signal(col. 8, lines 57-61) based on the disclosed ground plane positioning for communications with a mobile device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the reflector and dielectric as disclosed in Eason with the radiating element disclosed in Sabet to obtain an improved antenna(col. 4, lines 1-9) as disclosed in Eason.

### ***Response to Arguments***

3. Applicant's arguments, see the Amendment, filed July 26, 2004, with respect to the rejection(s)of claim(s) 1-25 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the same references as previously cited.

A ground plane is a reflector of electromagnetic energy, because it reflects incident electromagnetic energy as is very well known in the art. Consequently, the disclosed ground plane is also a reflector.

***Correspondence***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Jim Vannucci whose phone number is (571) 272-1820.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications only may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 872-9306.



James Vannucci